FIVE-YEAR REVIEW REPORT

15297

FINAL

First Five-Year Review Report
for

Presidio of Monterey Landfill
Monterey, California

September 2001

Prepared By: U.S. Army Environmental Center
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14. ABSTRACT
A Five-Year review was conducted at the Presidio of Monterey, located in Monterey California. The review was conducted for the Old Landfill from May -Sept 2001. This review focuses on the protectiveness of the landfill capping which was the selected remedy for the Landfill.

15. SUBJECT TERMS
Presidio of Monterey. Five-Year Review. Protectiveness Statement.

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POM OU-5
Five-Year Review Report

List of Acronyms

ARARs	Applicable or Relevant and Appropriate Requirements
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CRWQCB	California Regional Water Quality Control Board
DLI	Defense Language Institute
DTSC	Department of Toxic Substances Control
GCL	Geosynthetic clay liner
IRP	Installation Restoration Program
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
O&M	Operation and Maintenance
OUs	Operable Units
POM	Presidio of Monterey
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study

1.0 INTRODUCTION

A five-year review was performed for the Presidio of Monterey Landfill. The review was conducted from May 2001 through August 2001. This report documents the results of the review. The purpose of the five-year review is to determine whether the remedy at a site is protective of human health and the environment. In addition, the five-year review report will identify any deficiencies found during the review, if any, and identify recommendations to address them.

1.1 AUTHORITY AND PURPOSE

The U.S. Army performed this statutory five-year review under Section 121© of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), for review by the California Regional Water Quality Control Board. Section 121© states:

> "If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after initiation of the selected remedial action."

The purpose of a statutory review is to evaluate whether a completed remedial action remains protective of human health and the environment at sites where hazardous waste remains on-site at levels that do not allow for unlimited use and unrestricted exposure. This review focuses on the protectiveness of the remedy selected for the Presidio of Monterey Landfill, located in Monterey California.

1.2 DOCUMENTS CONSULTED

The primary references used in preparation of this report were:

- Decision Document for Closure of the Presidio of Monterey Landfill
- Annual Report of Observations and Maintenance Performed at the Presidio of Monterey Landfill, March 2001, Uribe & Associates
- Feasibility Study Evaluation or Remedial Alternatives Presidio of Monterey, Harding Lawson Associates, June 13, 1989

1.3 SITE BACKGROUND

The Presidio of Monterey (POM) comprises approximately one square mile of land, situated adjacent to downtown Monterey (Figures 1 and 2). The POM is located on the Monterey Peninsula along the north-central coast of California approximately 120 miles south of San Francisco. The installation consists primarily of the Defense Language Institute (DLI), where 27 foreign languages are taught to military personnel from all branches of the armed forces.

The Presidio of Monterey is a non-National Priorities List (NPL) site without an interagency agreement. The California Regional Water Quality Control Board (CRWQCB) Central Coast Region, an agency of the California Environmental Protection Agency, provides regulatory oversight for the Installation Restoration Program (IRP). The POM is a Resource Conservation and Recovery Act (RCRA) small quantity generator.

The IRP program at the POM was initiated in 1986 with the discovery of an old landfill. The landfill Remedial Investigation/Feasibility Study (RI/FS) was developed throughout 1989 and 1990. The Landfill is located in the western portion of the POM, adjacent to the PX Mini-mall and the Athletic Field (Figure 2). The Landfill is bordered to the east by Ord Road, the Athletic Field and the PX Mini-mall; and to the south southwest, and northeast by undeveloped Army property. The boundary between the POM and the City of Pacific Grove is downslope of the lower Landfill area and coincides with the northwest boundary of the Landfill site. A six-foot chain link fence runs along the boundary between the POM and the City of Pacific Grove.

The Landfill covers approximately 4 acres and is transected by Mason Road. In 1995, a cap was installed over the majority of the Landfill surface. The cap consists of a foundation layer, a low-permeability geosynthetic clay liner (GCL), a sandy filter layer, and a vegetative soil layer that is suitable for supporting plant growth. The vegetative soil layer was seeded with a mixture of mostly native plants that was selected to control erosion. In addition to the cover, site improvements included the installation of a surface water drainage system , the installation of a subdrainage system, and the construction of a retaining wall along the northwest border of the site.

The current Landfill configuration consists of an upper Landfill area (upper cell), located east of Mason Road, and a lower Landfill area (lower cell), located west of Mason Road. Figure 3 includes property boundaries, approximate Landfill boundaries, and roads and structures that lie within, or immediately adjacent to, the Landfill.

Landfill control features (controls) consist of site surface vegetation and stormwater/drainage control systems (Figure 3). Surface water runoff is controlled by a system of concrete v-ditches and subdrains. The Landfill is bounded by drainage v-ditches and subdrains along the downslope boundaries of both the upper Landfill area and the lower Landfill area. The Landfill is graded to conduct water to the concrete v-ditches. Subdrains are situated immediately adjacent to and upslope of the v-ditches and behind the retaining wall. Subdrains discharge to the concrete v-ditches. Drainage from the upper Landfill v-ditches discharges to a concrete culvert that passes under Mason Road. Drainage from the lower Landfill discharges to a grated inlet located in the west corner of the site. Drainage from the upper Landfill and lower Landfill areas connect to a common storm drainage system that directs collected water offsite.

2.0 REMEDIAL ACTIONS

2.1 REMEDIAL ACTION OBJECTIVES

The objective of the Landfill remedial action is to protect human health and the environment through the maintenance of a landfill cap. In 1988, a Remedial Investigation, Feasibility Study (RI/FS) and Risk Assessment were performed for the Landfill. On-post landfill soil samples indicated elevated concentrations of priority pollutant metals and pesticides. Lead and Arsenic relating to the Landfill were also found in the backyard of 319 Bishop Ave. The objective of the remedial action was to eliminate surface exposure of the contaminants (primarily lead, pesticides, and arsenic) and reduce the potential for dermal contact, inhalation, and ingestion for military residents and personnel, workers, and off-post residents.

2.2 SUMMARY OF THE SELECTED REMEDY

The preferred alternative for the remediation of the POM landfill was closure as a Class III facility. Remedial actions at the POM Landfill included the construction of a retaining wall along the landfill at the property line; installation of surface and subsurface control systems; and placement of a cap. The capping alternative provides overall protection of human health and the environment through the construction of an impervious cap over the entire landfill. The landfill was capped in accordance with the closure requirements for a Class III landfill contained in Title 23, Code of California Regulations. The preferred alternative for the refuse and contaminated soil behind the affected off-post residence was waste removal and on-site disposal/consolidation with the POM landfill materials. This alternative removed the 200 cubic yards of contaminated refuse and soil from the off-post residence and thereby mitigating the human exposure risks.

3.0 FIVE-YEAR REVIEW FINDINGS

3.1 INTERVIEWS

The following individuals were interviewed in person as part of the five-year review.

- Mr. & Mrs.Herbert Heller
  331 Bishop Avenue
  Pacific Grove, CA 93955

The Hellers have lived adjacent to this landfill for over 30 years. During the Spring inspection, they noted that there were no issues with surface water drainage (the culverts were cleaned out to allow for uninterrupted water flow) but they suggested that the dense vegetation on the steep western slope be removed. Based on the Heller's suggestion and as part of the quarterly O&M plan, the Army removed all the deep-rooted vegetation and trimmed the rest. During the (May) inspection, the Hellers expressed their appreciation for the vegetation removal and had no further observations to report. It should be noted that the Hellers are the "unofficial" daily observers of the landfill. They do not hesitate to call the Ft. Ord environmental office or the Garrison Commander if they have concerns about the landfill.

- Ms. Daphne White
  337 Bishop Avenue
  Pacific Grove, CA 93955

Ms. White has lived adjacent to this landfill for over 10 years. She was involved with the landfill construction by 1) allowing an air monitor to be housed in her backyard during all of the construction activities and 2) meeting with a risk assessor to discuss the meaning of the soil sample results. In April 2001 she contacted the environmental office to suggest removing the flammable, invasive weeds from the landfill slope. This action has been completed by the Army.

3.2 SITE INSPECTION

Representatives from Directorate of Environmental and Natural Resources of the Presidio of Monterey, and the U.S. Army Environmental Center inspected the landfill on May 25, 2001. Representatives from Directorate of Environmental and Natural Resources of the Presidio of Monterey and the California Regional Water Quality Control Board inspected the landfill on June 14, 2001. A site inspection checklist for the Landfill was completed and is included in Appendix A. Much of the information was obtained prior to the site inspection through phone interviews and review of available documents. Weather conditions during the inspections were favorable with mild temperatures and sunny conditions.

The landfill cap was found to be in good condition overall. The grass cover had been recently mowed except for one stretch along the northwestern boundary of the upper cell on a steep slope. There were no excessive cracks, noticeable depressions, leachate seeps, odors, or distressed vegetation. There was some evidence of small rodent burrows that were constructed on the southeast side of the lower cell. Animal control programs were last implemented by the installation in March 1999 and April 1999. As a result of this inspection, the Army plans on removing the rodents and backfilling the burrows during the next quarterly maintenance for this area.

Components of the drainage control system were also inspected. This included pipes, v-ditches, the concrete catch basin at the west end of the site, and the grated inlet in the catch basin. These features were found to be in good condition with no signs of stress or damage. The retaining wall was also inspected and showed no signs of cracking, settlement or signs of movement.

Based upon observations made during the inspections, the existing landfill cover, vegetative cover, and stormwater/drainage system appear to have been appropriately maintained and have not been subject to significant degradation.

3.3 ARARS REVIEW

The preamble to the National Contingency Plan (NCP) at 55 FR 8758 (March 8, 1990) states that "a policy of freezing ARARs at the time of ROD signing will not sacrifice protection of human health and the environment because the remedy will be reviewed for protectiveness every five years, considering new or modified requirements at that point, or more frequently, if there is reason to believe that the remedy is no longer protective of health and environment." At the POM, the landfill was closed according to the requirements in 27 CCR §§ 20950 and 21090 (sections former location at 23 CCR §§ 2580 and 2581) as a Class III solid waste landfill; however, no specific ARARs or cleanup levels were established in the ROD. The remedies for the landfill and the off-post contamination on Bishop Avenue were selected to eliminate or reduce exposure to site contaminants in order to mitigate risk. At the time the ROD was signed, there were no chemical-specific ARARs for the cleanup of these contaminants in soils and an evaluation of current state and federal requirements indicates that no new requirements have been promulgated. The landfill continues to be maintained in a protective manner according to the post-closure requirements at 27 CCR §§ 21090.

3.4 DEFICIENCIES

Only minor deficiencies were discovered during the five-year review. None of these are sufficient to warrant a finding of not protective. Repairing the areas where small animal burrows were observed will be necessary to prevent any deterioration of the cap. Mowing on the western side of the upper cell should be performed on a regular basis.

3.5 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Continue to perform wet and dry weather inspections as specified in the O&M Plan. The inspections should focus on the conditions of the following landfill features:

- Inspect pipes, v-ditches, the concrete catch basin at the west end of the site, and the grated inlet in the catch basin for signs of damage or distress.

- Inspect the concrete catch basin at the west end of the site and the grated inlet in the catch basin for visual evidence of excess siltation.

- Inspect v-ditches for the presence of sediment (from surface erosion or the landfill cover or animal burrows), debris, vegetation debris, or overgrown vegetation.

- Inspect inlets at the catch basin and at the culvert beneath Mason Road for evidence of blockage.

- Inspect the outfalls for the retaining wall subdrainage for blockage.

- Inspect the downslope perimeter fence for damage.

- Inspect the vegetation cover for evidence of movement, animal burrowing, erosion, soil cracking, or standing water.

4.0 PROTECTIVENESS STATEMENT

The components of the POM Landfill remedy remain protective of human health and the environment. The cap is effective at containing contaminants through preventing infiltration of rainwater and preventing direct contact with contaminated soils. The cap is also protective of human inhalation, ingestion, and direct contact with contaminants.

5.0 NEXT REVIEW

It should be noted landfill inspections take place on a quarterly basis as part of the O&M Plan. In addition, an annual report is prepared each year which summarizes the observations and maintenance performed at the landfill. The next 5-year review is scheduled for July 2006.

FIGURE 1 SITE LOCATION MAP

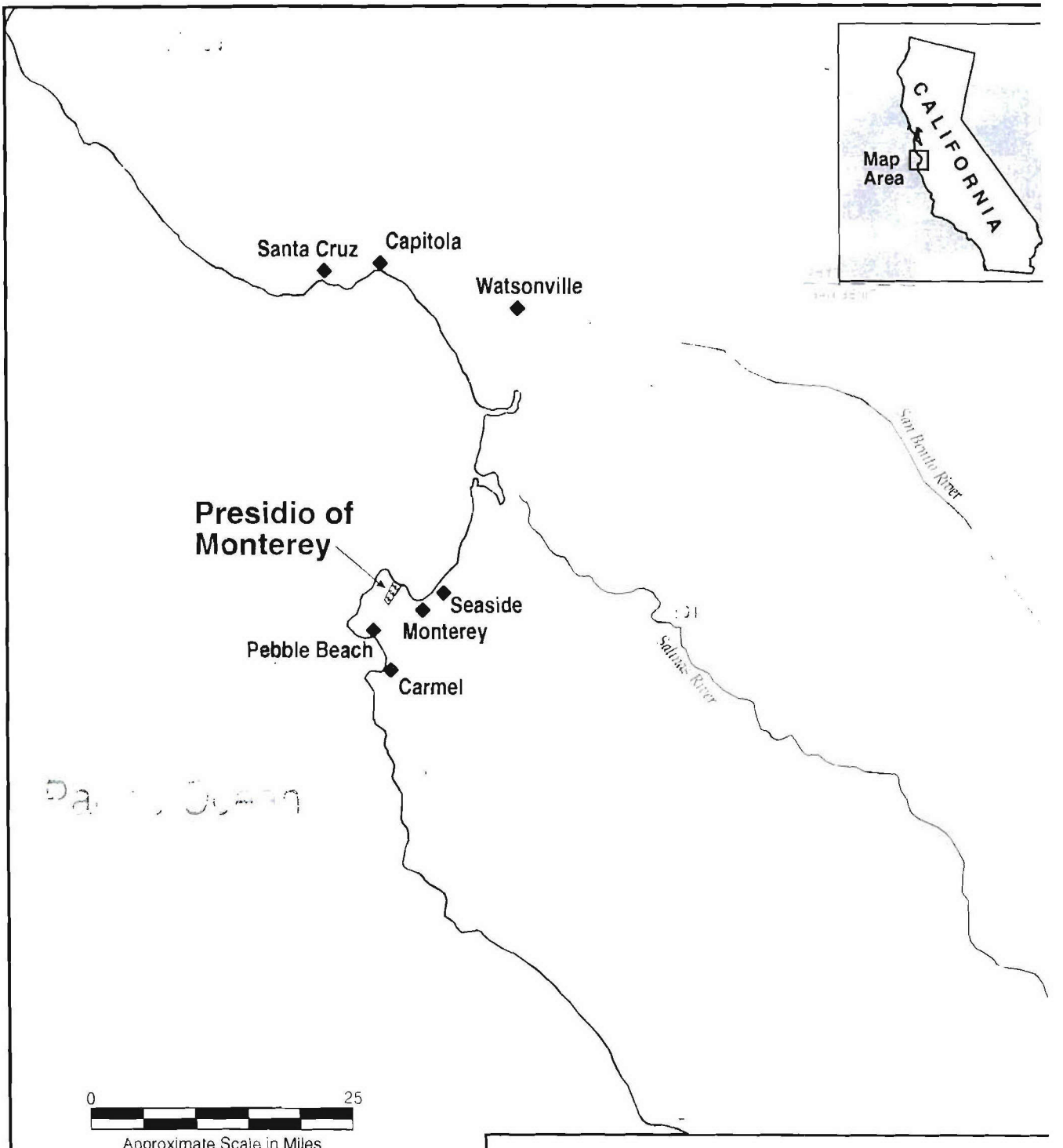


FIGURE 1

URIBE & ASSOCIATES
Engineering and Environmental Services

Location of Presidio of Monterey
Regional Location Map

FIGURE 2 LOCATION OF POM LANDFILL

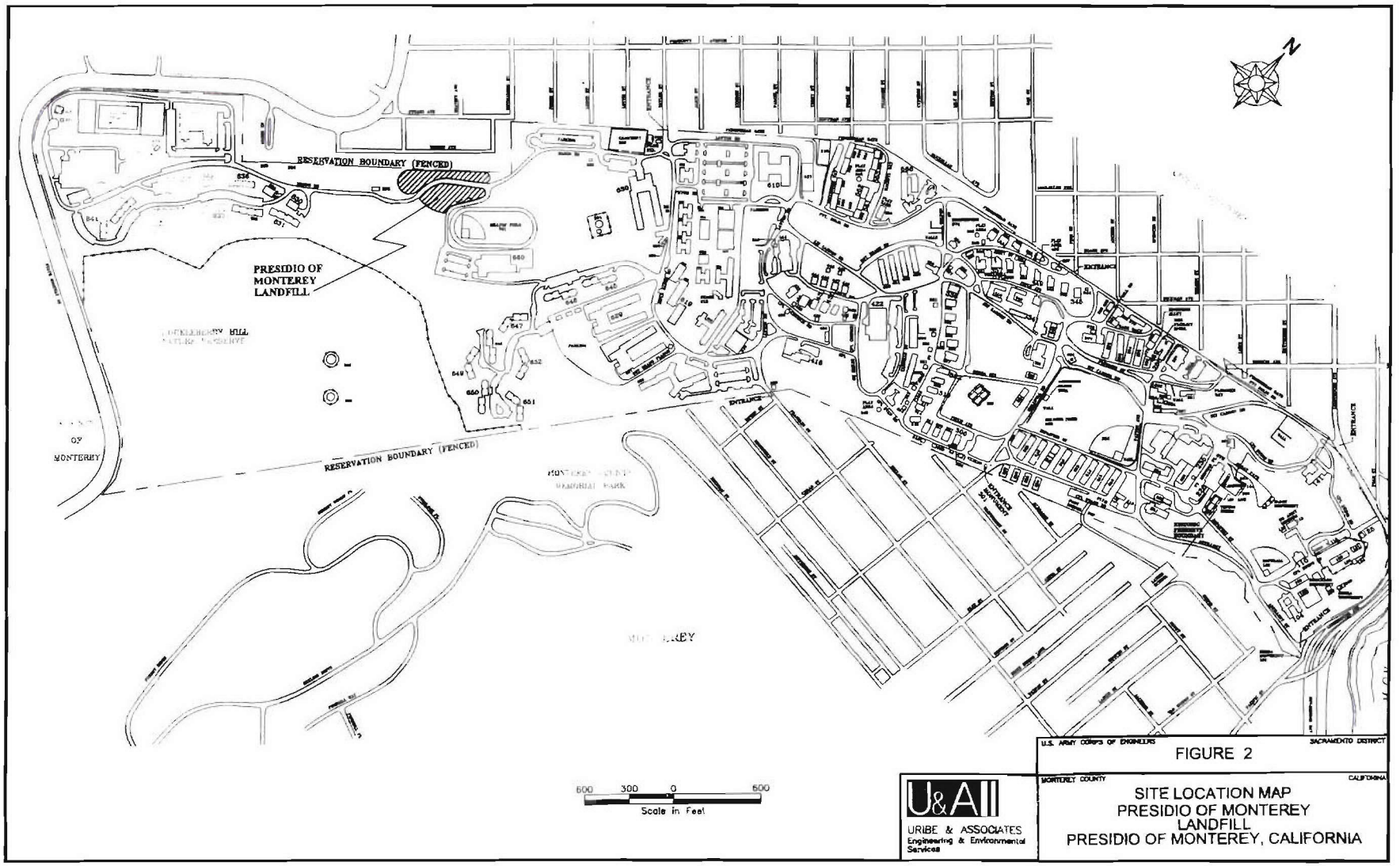


FIGURE 2

SITE LOCATION MAP
PRESIDIO OF MONTEREY
LANDFILL
PRESIDIO OF MONTEREY, CALIFORNIA

FIGURE 3 SITE TOPOGRAPHY

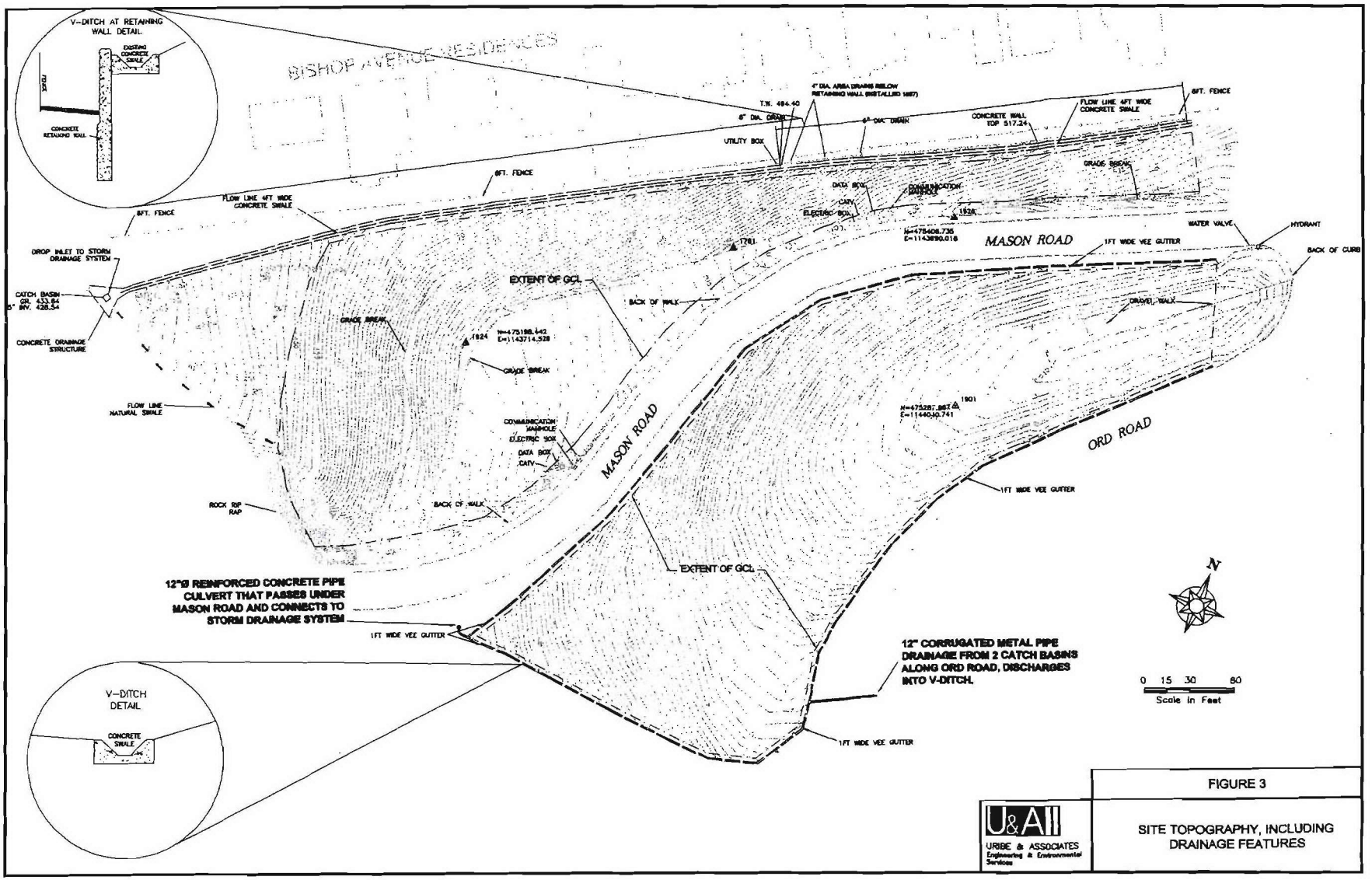


FIGURE 3

URIBE & ASSOCIATES Engineering & Environmental Services

SITE TOPOGRAPHY, INCLUDING DRAINAGE FEATURES

APPENDIX A
SITE INSPECTION CHECKLIST

Five Year Review Site Inspection Checklist

I. SITE INFORMATION

Site name: Old Landfill POM OU-5 **Date of inspection:** 5/24/01, 6/14/01

Location and Region: Monterey CA EPA Region IX

Agency conducting five-year review: U.S. Army Environmental Center

Weather/temperature: Sunny 70 degrees

Remedy Includes: (check all that apply)

X Landfill cover/containment
__Access controls
__Institutional controls
__Groundwater pump and treat
__Surface water collection and treatment
__Other

Attachments: __Inspection team roster attached X Site map attached

II. INTERVIEWS

1. **O&M site manager** Melissa Hlebasko **title** Env. Protection Specialist
   Date 5/25/01 **Phone** 831 393-1284
   Problems, suggestions
   none

2. **O&Mstaff** _____ **title** _____ **date** _____
   Problems, suggestions
   none

3. **Local regulatory authorities and response agencies**

   Agency CA Regional Water Quality Control Board

   Contact Grant Himebaugh **title** Geologist/RPM **date** 6/14/01
   Phone 805 542-4645

4. **Other interviews**

   Mr. & Mrs. Herbert Heller
   331 Bishop Ave
   Pacific Grove, CA 93955

   Ms. Daphne White
   337 Bishop Ave
   Pacific Grove, CA 93955

III. ONSITE DOCUMENTS & RECORDS VERIFIED

1. **O&M Documents**
   X O&M manual X readily available X up to date __ N/A
   X As built drawing X readily available __ up to date __ N/A
   X Maintenance logs X readily available __ up to date __ N/A
   Remarks: _____

2. **Site-Specific Health and Safety Plan** X readily available X up to date __ N/A
   Contingency plan X readily available X up to date __ N/A

3. **O&M records** X readily available X up to date __ N/A

4. **Permits** X readily available X up to date __ N/A

5. **Gas Generation Records** __ readily available __ up to date X N/A

6. **Settlement Monument Records** __ readily available __ up to date X N/A

7. **Groundwater Monitoring Records** __ readily available __ up to date X N/A

8. **Leachate Extraction Records** __ readily available __ up to date X N/A

9. **Daily Access Logs** __ readily available __ up to date X N/A

IV. O& M COSTS

1. **O&M Organization**
   __State in-house __contractor for State
   __PRP in-house X contractor for PRP
   __Other_____

2. **O&MCostRecords**
   X Readily available __up to date
   __Funding mechanism/agreement in place
   Original O&M cost estimate__100k per year_____

3. **Unanticipated or Unusually High O&M Costs During Review Period**
   Routine maintenance such as hydroseeding and grass mowing was performed during the rating period. No unusually high costs were experienced.

V. GENERAL SITE CONDITIONS

A. Fencing

1.Fencing damages __Location shown on site map __ Gates secured X N/A

B. Site Access

1.Access restrictions, signs, other security measures
__Location shown on map X N/A
Remarks_____
_____
_____

C. Perimeter Roads

1.Roads damaged __ Location shown on site map X Roads adequate __N/A

D. General

1. Vandalism/trespassing __ Location shown on map X No vandalism evident
2. Land use changes on site X N/A
   Remarks not anticipated, open space designation in master plan
3. Land use changes off site X N/A
   Remarks_____
   _____
   _____

E. Other Site conditions

Remarks Several deer were spotted on the landfill during the inspection on May 25, 2001.

VI. LANDFILL COVERS

A. Landfill Surface

1. Settlement (low spots) __ Location shown on map X not evident
Areal extent _____ Depth_____
Remarks_____
_____

2. Cracks __ Location shown on map X Cracking not evident
Lengths _____ Widths _____ Depths _____
Remarks_____
_____

3. Erosion__Location shown on map X Erosion not evident
Areal extent_____ Depth _____
Remarks_____
_____

4. Holes __ Location shown on map X Holes not evident
Areal extent _____ Depth _____
Remarks_____
_____

5. Vegetative Cover X Grass X Cover properly established
X No signs of stress __Trees/shrubs(show size and locations)
Remarks_____
_____

6. Alternative Cover (armored rock, concrete, etc.) X N/A
Remarks_____
_____

7. Bulges __ Location shown on map X Bulges not evident
Areal extent _____ Height _____
Remarks_____

8. Wet Areas/Water Damage X Wet areas/water damage not evident
__Wet areas __ Location shown on map Areal extent_____
__Ponding __Location shown on map Areal extent_____
__Seeps __Location shown on map Areal extent_____
__Soft/Subgrade __Location shown on map Areal extent_____

Remarks_____

9. Slope Instability __ Slides __ Location shown on map
X No evidence of slope instability Areal extent_____
Remarks_____

B. Benches X Applicable __ N/A

1. Flows Bypass Bench __Location shown on map X N/A or OK
2. Bench Breached __Location shown on map X N/A or OK
3. Bench Overtopped __ Location shown on map X N/A or OK

C. Letdown Channels X Applicable __ N/A
(Channel lined with erosion control mats, riprap, groutbags, or gabions that descent down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. Settlement __Location shown on map
X No evidence of settlement Areal extent _____ Depth _____
Remarks_____

2. Material Degradation
__Location shown on map X No evidence of degradation
Material type _____ Areal extent_____
Remarks_____

3. Erosion__Location shown on map X No evidence
Areal extent _____ Depth _____
Remarks_____

4. Undercutting
__Location shown on map X No evidence of undercutting
Areal extent _____ Depth _____
Remarks_____

5. Obstructions Type_____ X No obstructions
__Location shown on map Areal extent_____Size_____
Remarks_____

6. ExcessiveVegetativeGrowth Type native grasses
__ No evidence of excessive growth
__Vegetation in channels does not obstruct flow
__Location shown on map Areal extent_____
Remarks tall grasses observed along northern edge of landfill

D. Cover Penetrations __ Applicable X N/A

1. GasVents __Active __Passive
__Properly secured/locked __ Functioning __ Routinely sampled
__Good condition __ Evidence of leakage at penetration
__Needs O&M __ N/A
Remarks_____

2. Gas Monitoring Probes
__Properly secured/locked __ Functioning __ Routinely sampled
__Good condition __ Evidence of leakage at penetration
__Needs O&M __ N/A
Remarks_____

3. Monitoring Wells (within surface area of landfill)
__Properly secured/locked __ Functioning __ Routinely sampled
__Good condition __ Evidence of leakage at penetration
__Needs O&M __ N/A
Remarks_____

4. Leachate Extraction Wells
__Properly secured/locked __ Functioning __ Routinely sampled
__Good condition __ Evidence of leakage at penetration
__Needs O&M __ N/A
Remarks_____

5. Settlement Monuments __ Located __ Routinely surveyed __ N/A

E. Gas Collection and Treatment __ Applicable X N/A

F. Cover Drainage Layer X Applicable __ N/A

1. Outlet Pipes Inspected X Functioning __ N/A
Remarks_____

2. Outlet Rock Inspected X Functioning __ N/A
Remarks_____

G. Detention/Sediment Ponds __ Applicable X N/A

1. Siltation Areal extent _____ Depth _____ ___N/A
__Siltation not evident
Remarks_____
_____

2. Erosion Areal extent _____ Depth _____
__ Erosion not evident
Remarks_____

3. Outletworks __Functioning __N/A
Remarks_____

4. Dam __Functioning __ N/A

H. Retaining Walls X Applicable __ N/A

1. **Deformation** X Location shown on map
   X Deformation not evident
   Horizontal displacement_____
   Vertical displacement_____
   Rotational displacement_____
   Remarks_____

2. **Degradation** __Location shown on map
   X Degradation not evident
   Remarks_____
   _____

I. Perimeter Ditches/Off-Site Discharge X Applicable __N/A

1. **Siltation** __ Location shown on map X Siltation not evident
   Areal extent _____Depth_____
   Remarks_____
   _____

2. **Vegetative Growth** X Location shown on map __N/A
   __Vegetation does not impede flow
   Areal extent_____ Type_____
   Remarks_____
   _____

3. **Erosion** __ Location shown on map X Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____
   _____

4. **Discharge Structure** __ Functioning X N/A
   Remarks_____
   _____

J. Vertical Barrier Walls _X Applicable __ Not applicable

1. __ Settlement __ Location shown on map X Settlement not evident
   Areal extent _____ Depth _____
   Remarks _____
   _____

VII. INSTITUTIONAL CONTROL

A. Fencing

1. __ Fencing damaged __ Location shown on map __ N/A
   Remarks fencing well maintained bordering homes on Bishop Ave

B. Deed Restrictions __ Deed restrictions recorded __ N/A

D. Land Use Changes

1. __ Vandalism __ Location shown on map X No vandalism evident

2. Changed Site Conditions __ Evident X Not evident

3. __ Land Use Changes Onsite __ Evident X Not evident
   __ Consistent with risk assessment assumptions in ROD
   __ Inconsistent with risk assessment assumptions in ROD
   __ N/A

4. __ Land Use Changes Offsite X N/A

5. __ Institutional Controls X N/A
   Agency _____
   Contact _____

VII. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.)

The objective of the remedial action was to eliminate surface exposure of contaminants and reduce the potential for dermal contact, inhalation, and ingestion. The remedy is effective at containing the contaminants. It is preventing infiltration of rainwater and is protective of human exposure.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

The O&M Plan for the POM Landfill describes procedures for conducting regular site inspections and performing site maintenance. The O&M contractor has performed both wet weather and dry weather inspections. Periodic maintenance was performed on the landfill primarily the removal of deep rooted vegetation, removal of dirt and debris from drainage ways, and hydroseeding selected areas to improve vegetative growth. Based upon these actions, the landfill cover and stormwater/drainage system appears to have been appropriately maintained. As a result, the remedy is protective and it is anticipated that properly maintained landfill controls will continue to perform to design standards.

C. Early Indicators of Potential Remedy Failure

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

To date the majority of repairs and improvements have been minor in nature. Isolated areas that have experienced minor distress (e.g., animal burrows, sparse vegetation, and deep rooting plant species) must continue to be carefully maintained. As long as the O&M procedures continue as scheduled, long term protectiveness should occur.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

Since animal abatement programs and grass seeding are likely to be an ongoing element of the landfill maintenance program, opportunity for optimization of monitoring tasks are unlikely at this time.

APPENDIX B
PHOTOGRAPHS FROM THE SITE INSPECTION

Photo taken from Ord Road looking NNW at lower cell

Photo taken on top of lower cell looking SSW

View of bottom half of lower cell looking South

Photo taken of culvert on Southeast side of lower cell

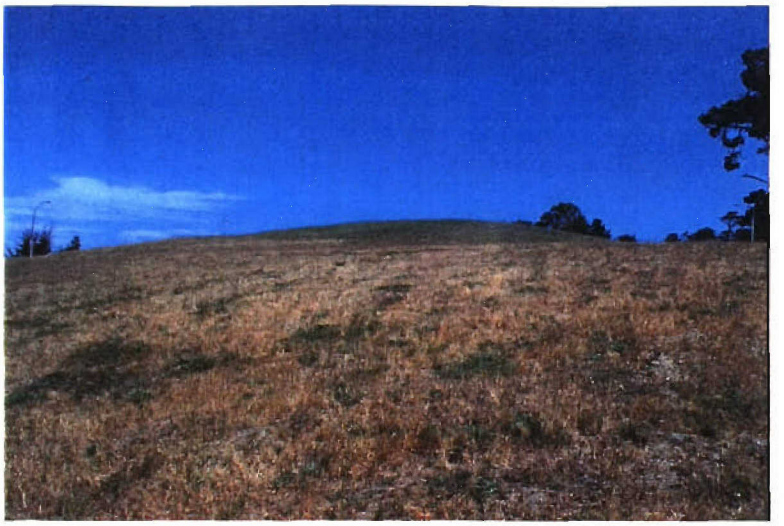
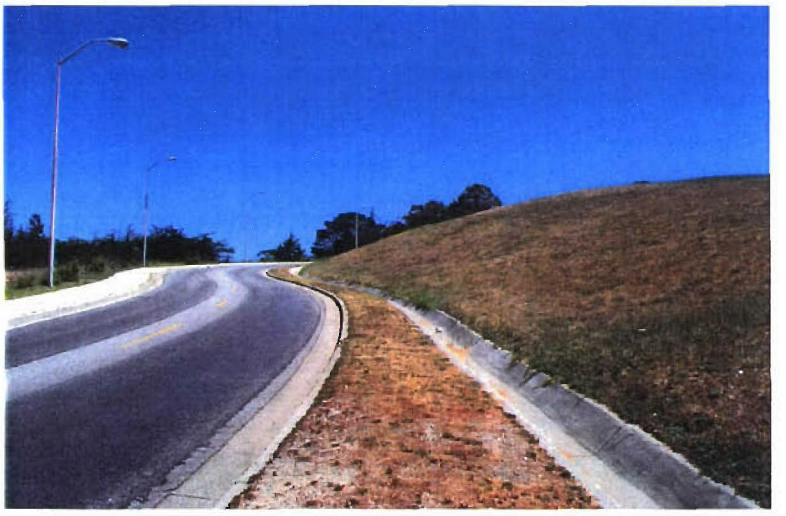


Photo looking from south to north in center of lower cell



Mason Road looking north between both landfill cells

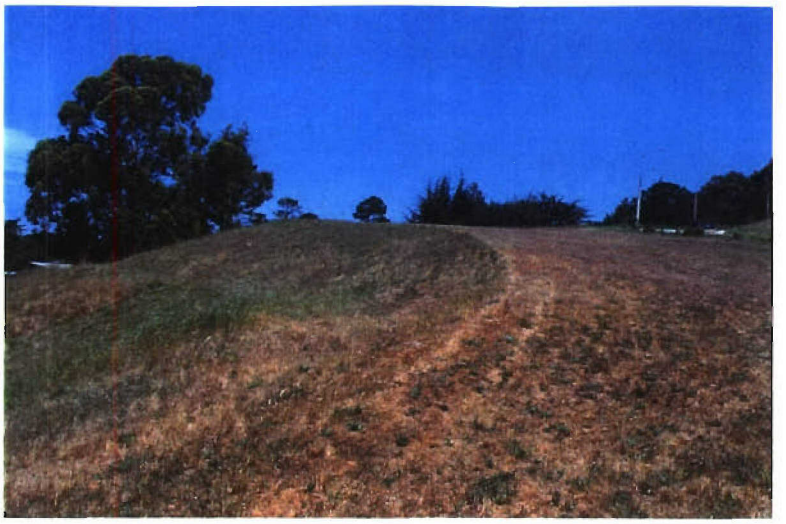


Photo of upper cell looking north

Mason road looking south at lower cell